REMARKS

Claims 54-90 are all the claims pending in the application.

Applicant thanks the Examiner for conducting an interview with the undersigned on July 16, 2007. A separate Statement of Substance of Interview is submitted herewith. Applicant responds to the Office Action consistent with the discussion during the interview.

Rejection of Claim 90 Under 35 U.S.C. § 112, First Paragraph

Claim 90 is rejected under 35 U.S.C. § 112, first paragraph as allegedly not being supported by a written description of the invention. Applicant respectfully traverses the rejection.

Claim 90 depends from claim 85 which is directed to an index list structure for use in locating and extracting a fragment of metadata. The index list structure includes a fragment type field containing an encoded value specifying a location of the fragment. Claim 90 recites "wherein the index structure is contained in a container, the container having a string repository, wherein the string repository does not contain a string corresponding to the encoded value." The Examiner asserts that the specification does not support the string repository not containing a string corresponding to the encoded value.

The patent statute, at 35 U.S.C. § 112, first paragraph, requires each claim in an application to be supported by a written description of the invention. As stated in the MPEP §2163 (I), "To satisfy the written description requirement, a patent specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention. See, e.g., *Moba, B.V. v. Diamond Automation, Inc.*, 325 F.3d 1306, 1319, 66 USPQ2d 1429, 1438 (Fed. Cir. 2003); *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d at 1563, 19 USPQ2d at 1116."

The written description requirement requires that "each claim limitation must be expressly, implicitly, or inherently supported in the originally filed disclosure. When an explicit limitation in a claim 'is not present in the written description whose benefit is sought it must be shown that a person of ordinary skill would have understood, at the time the patent application was filed, that the description requires that limitation.' *Hyatt v. Boone*, 146 F.3d 1348, 1353, 47 USPQ2d 1128, 1131 (Fed. Cir. 1998). See also *In re Wright*, 866 F.2d 422, 425, 9 USPQ2d 1649, 1651 (Fed. Cir. 1989)." MPEP 2163 II.A.3.(b).

Here, Applicant submits that a person of skill in the art familiar with the TV-Anytime Form specifications, would readily understand from reading the present specification that the string repository in a container does not contain a string corresponding to the encoded value described in the specification. The specification in paragraph [14] describes an index container that includes a string repository. An index container is shown in Fig. 5 and is described in paragraph [15]. As shown in Fig. 5, the index container contains a key index list section 10. A key index list is shown in Table 1, which contains the fragment_type field which can contain the encoded values that are assigned to standard fragment types frequently used. See para. [111]. The specification further describes the fragment_type field as being 8 bits which corresponds to the field length of the fragment_type shown in Table 1 (e.g., 8 bits - changeable). Accordingly, a person of ordinary skill in the art would readily understand that the specification describes storing the encoded value in the index table shown in Table 1 and not in the string repository. Hence, a person of ordinary skill in the art would understand that the inventor had possession of the claimed subject matter.

Rejections Under 35 U.S.C. § 101

Claims 54-90 are rejected under 35 U.S.C. § 101 for allegedly being directed to non-statutory subject matter. Applicant respectfully traverses the rejection and submits that the claims are statutory for at least the following reasons.

Considering first claim 54, the Examiner bases the rejection on the premise that "the claim contains an abstract idea (e.g., 'searching and extracting')." Office Action at p. 4. Based on that premise, the claim is analyzed as if it is directed only to an abstract idea and the Office Action jumps to an analysis of whether the claim is drawn to a practical application of the alleged idea. This position presupposes that the claim is drawn to a mere idea. It is not. Applicant respectfully submits that claim 54 as a whole clearly is directed to patentable subject matter and not merely to an idea. Claim 54 recites "An index structure for metadata divided into fragments, the index structure contained in a computer readable storage medium." The index structure being contained in a computer readable storage medium is not a mere idea; it is an article of manufacture. See *In re Lowry*, 32 F.3d 1579, 32 USPQ2d 1031 (Fed. Cir. 1994).

In *Lowry* the Court acknowledged that the Board of Patent Appeals and Interferences (Board) found that a data structure stored in a memory defines patentable subject matter. For example, the Court stated:

> 1. A memory stores data according to a particular order or arrangement. Application programs use stored data to perform specified functions. A data model provides the framework for organizing and representing information used by an application program. Data models define permissible data structures -- organizational structures imposed upon the data used by the application program -- compatible with particular data processing systems. Data structures are the physical implementation of a data model's organization of the data. Data structures are often shared by more than one application program.

Id. at 1032.

The Court in *Lowry* further stated the following finding that the data structures in a memory are not mere abstractions but are structural elements that provide tangible benefits:

> 2. More than mere abstraction, the data structures are specific electrical or magnetic structural elements in a memory. According to Lowry, the data structures provide tangible benefits: data stored in accordance with the claimed data structures are more easily accessed, stored, and erased. Lowry further notes that, unlike prior art data structures, Lowry's data structures simultaneously represent complex data accurately and enable powerful nested operations. In short, Lowry's data structures are physical entities that provide increased efficiency in computer operation. They are not analogous to printed matter. The Board is not at liberty to ignore such limitations.

Id. at 1035.

As in *Lowry*, claim 54 is directed to a data structure contained in a computer-readable storage medium, and hence, recites patentable subject matter.

The specification clearly describes a useful, tangible and concrete result of the inventive index structures. For example, paragraph [01] states: "the present invention relates to an index structure of metadata ... at least a part of which is encoded so as to allow information on contents to be more efficiently searched ...." The specification also states, in paragraph [28] "An object of the present invention is to provide an index structure of metadata including information of a key encoded so as to allow information on contents to be searched more quickly." The specification makes abundantly clear that the claimed index structure produces a useful, concrete and tangible result.

Claim 54 recites "locating and extracting a fragment of the metadata" using the claimed index structure. The Examiner asserts that "searching or extracting" are merely abstract manipulations that do not realize a "useful, concrete and tangible result." Office Action at p. 4. Applicant disagrees. Aside from the claimed index structure corresponding closely to *Lowry's* data structure contained in a memory which the Federal Circuit held to be patentable subject

matter, extracting a fragment of metadata allows the metadata to be used for a variety of real and useful purposes. It is not an abstract idea. For example, metadata is used for displaying titles and schedules of TV programs which allow a user to select a desired program. See para. [04]. If the fragment of metadata cannot be located and extracted the metadata cannot provide useful information to the user and enable useful features such as allowing a user to select a program based on displayed metadata. A mere idea does not provide for locating and extracting metadata that is then used to enrich a television experience.

Further, the present application discloses that the claimed index structure provides tangible benefits. For example, the application in paragraph [148] describes the index structure as allowing for more efficient searches and access to information about content. The index structure also reduces the overhead for searching for metadata. Para. [147].

Not only has the Federal Circuit found data structures stored in a memory to be directed to statutory subject matter, the USPTO has long recognized that computer programs embodied on a tangible medium are patentable subject matter. *In re Beauregard*, 53 F.3d 1583, 35 USPQ2d 1383 ("The Commissioner now states 'that computer programs embodied in a tangible medium, such as floppy diskettes, are patentable subject matter under 35 U.S.C. § 101 and must be examined under 35 U.S.C. §§ 102 and 103.'").

The Examiner also asserts that the claims are directed to non-functional descriptive matter stored on a computer readable medium, and hence, are non-statutory. Applicant respectfully traverses this ground of rejection. As stated in the Interim Guidelines for Examination of Computer Related Inventions, Annex IV Computer-Related Nonstatutory Subject Matter, descriptive material is broken down into "functional descriptive material" and "non-functional descriptive material." As stated in the Guidelines "'functional descriptive

material' consists of data structures and computer programs which impart functionality when employed as a computer component." In contrast, "'[n]onfunctional descriptive material' includes but is not limited to music, literary works and a compilation or mere arrangement of data." See MPEP 2106.01.

The claimed index structure contained in a computer-readable storage medium closely corresponds to the functional data structures described in the MPEP rather than the non-functional music, literary works, etc. Contrary to the assertion in the Office Action that the claimed index structure is "a mere arrangement of data" Applicant points out that the claim recites a functional relationship between the elements of the claim. For example, the claim recites a list of keys and location information for defining a key used for locating and extracting the fragment of metadata. This is not a mere arrangement of data like music tracks on a CD. Rather the claim defines a functional relationship between the elements of the claim and thus recites patentable subject matter. The specification throughout makes clear that the index structure imparts functionality when used by a computer. For example, the specification at paragraphs [138] through [146] describes how the index structure can be used to search for metadata.

Regarding claim 63, it is rejected under §101 as being drawn to nonfunctional descriptive material. Claim 63 also recites an index structure for metadata in which the index structure is contained in a computer readable storage medium. The claim recites a key index list, a key index section and a sub-key index section. The key index list of claim 63 comprises a list of keys corresponding to fields of the metadata and location information for defining the keys and locating and extracting fragments of the metadata. Claim 63 does not merely recite an arrangement of data. Rather, it recites functional fields that enable the functions of locating and

extracting fragments of metadata. Accordingly, the claim does not recite a mere arrangement of data but rather imparts functionality when employed by a computer, as discussed, for example, in paragraphs [138] through [146].

Applicant respectfully submits that the remaining claims are directed to patentable subject matter for similar reasons.

Rejections Under 35 U.S.C. § 103: Claims 54-84

Claims 54-84 are rejected under §103(a) as being unpatentable over the Evain reference in view of Wan (U.S. Patent Publication No. 2004/0028049). Applicant respectfully traverses the rejection.

Claim 54, for example, is directed to an index structure for metadata divided into fragments, in which the index structure is contained in a computer readable storage medium. The index structure includes a list of keys corresponding to fields of the metadata, and location information for defining a key and locating and extracting a fragment of the metadata. The claim recites "at least a part of the location information is expressed as a predetermined code, the predetermined code being assigned to said at least a part of the location information according to a convention for associating codes with portions of the metadata."

Evain is cited for teaching all the elements of the claim except for the claim limitation concerning the location information being expressed as a predetermined code that is assigned to at least part of the location information according to a convention for associating codes with portions of the metadata. Wan is cited for disclosing this limitation missing from Evain.

Wan is directed to a scheme for encoding an XML (Extensible Markup Language) document to support streaming of the XML document. See Wan para. [0001] and [0021]. Wan is concerned with solving problems with existing encoding schemes. The problems with such

encoding schemes, according to Wan, are that they do not support streaming of XML documents and cannot efficiently locate elements in encoded XML documents using the XPath/XPointer addressing scheme. See para. [0010]. Wan describes a technique of encoding an XML document by separating the structure from the text of an XML document and transmitting them either in separate streams or concatenated in a single stream. See para. [0043]. Wan shows two such streams in Fig. 1. The structure stream 106 carries the structure of the XML document and the text stream 108 carries the text of the XML document. See also para. [0044]. Wan states that "[s]eparating structure and text in an encoder allows the corresponding decoder to parse the structure of the document more quickly thereby processing only the relevant elements while ignoring elements (and descendents) that it does not know or require." Wan para. [0047]. Wan describes XML tags as comprising an element name and a set of attribute names/pairs. Wan para. [0052]. According to Wan, "separating an element name from the attributes will allow the document tree to be parsed and elements to be located more quickly." *Id.* Wan states that the element names and the attribute names and values of an XML document "can be assigned codes to reduce the number of bytes required to encode them." Wan para. [0049].

Wan describes an XML document encoder that "may include a number of encoding formats for different types of structure and text within the XML document." Wan para. [0056]. In paragraph [0058] Wan describes Fig. 10 which shows "a method 1000 of encoding an XML document." The method examines the XML document 104 to identify each data type forming part of the XML document 104." Wan encodes each part of the XML with the appropriate encoding technique depending to the data types contained in that part of the XML document. *Id.*

Wan also describes using XPath/XPointer fragments to reference and locate XML elements. Wan para. [0078]. According to Wan an "XPath/XPointer fragment consists of a list

of location steps representing the absolute or relative location of the required elements(s) within an XML document", in which typically "the fragment contains a list of element names." Wan para. [0092]. Wan explains that the "compactness of the encoded document hierarchy allows it to be parsed (and instantiated) without expanding into a full object tree representation." Wan para. [0093]. To accomplish this goal, Wan discloses that the "fragment address is first translated into an encoded form" in order to match the fragment address with the encoded XML document elements. *Id.*

In rejecting the claims as being obvious over Evain in view of Wan, the Examiner asserts that it would have been obvious to have modified Evain's key index list to include an encoded XPath fragment because of Wan's teachings concerning benefits associated with XML encoding. It is respectfully submitted that Wan's teachings concern benefits that arise from encoding the elements and attributes of an XML document. Any benefits that Wan might disclose as arising from encoding an XPath fragment arise only because the XML document is encoded. A person of ordinary skill in the art would not have modified Evain to encode an XPath fragment in Evain's key index list since Wan is concerned with benefits arising from encoding XML document elements, not from storing encoded XPath fragments in a key index list.

Further, even if one would have modified Evain to use an encoded XPath fragment, an ordinarily skilled artisan would have no reason to modify Evain to depart from its principle of operation of storing strings, such as an encoded XPath expression, in the string repository Evain discloses. The position set forth in the Office Action that it would have been obvious to have stored an encoded XPath fragment in the key index list, contradicts Evain's teaching of storing all strings in the string repository of a TV-Anytime container. Accordingly, Evain and Wan, alone or in combination, do not render the claims unpatentable.

Considering the positions set out in the Office Action, the Examiner appears to take the position that as part of the step of encoding an XML document Wan discloses encoding the fragment address. ("In an encoding step, the fragment address is translated into an encoded form (a 'predetermined code', para. 0092-0093)."). See p. 6, para. "A1" of the Office Action. However, that portion of Wan (i.e., para. 0092-0093) clearly is directed to a step of searching the XML document, not a step of encoding the XML document. The Examiner also appears to assert that Wan, in paragraphs 0057-0058, discloses encoding an XPath fragment. However, that portion of Wan merely describes encoding the portions of an XML document. It does not disclose encoding an XPath fragment.

In paragraph "A2" of the Office Action, at page 6, it is asserted that Wan teaches assigning codes to element names and attribute names that are repeatedly used in a document. While Wan may teach such a feature regarding the elements and attributes of an XML document, Wan does not teach or suggest assigning codes to XPath fragments to reduce the number of bytes required to encode those fragments. In fact, Wan discloses encoding an XPath fragment only for the purpose of matching the XPath fragment with the encoded elements and attributes of the XML document. Wan neither teaches nor suggests encoding an XPath fragment "to reduce the number of bytes required to encode them," as asserted in the Office Action.

The Examiner, in paragraph "A5" of the Office Action at page 7, appears to assert that it would have been obvious to store an XPath address in its native text format in Evain's key index list because Wan discloses in para. 0057 "text strings with 0-9 characters may not be encoded." The Examiner appears to assert that a native XPath address recorded in the key index list would satisfy the claim. These positions ignore limitations in the claim and ignore the teachings of Evain. The claim requires that at least a part of the location information is expressed as a

predetermined code and that the predetermined code is assigned to at least a part of the location information according to a convention for associating codes with portions of the metadata. First, Evain teaches away from such a modification in that Evain discloses that all strings are recorded in the string repository, not in the key index list. See Evain 2.2.3 ("The string repository is used to hold all strings used by a given container."). Second, the Examiner reads the claim without taking into account the specification, as his reading of the claim is inconsistent with the description in the specification of a predetermined code. Accordingly, it would not have been obvious to have stored XPath fragments in the key index list of Evain.

In paragraph "A5" of the Office Action at page 7, it is further asserted that it would have been obvious to have modified the teachings of Evain to include encoding location information of a key or a fragment as a predetermined code where the predetermined code is assigned to at least a part of the location information according to a convention for associating codes with portions of the metadata. The Examiner appears to assert that a person of ordinary skill in the art would have been motivated to modify the teachings of Evain to encode XPath addresses in Evain's key index list to increase processing efficiencies, as allegedly taught by Wan in paragraph 0093. Wan, in paragraph 0093, merely describes an efficiency in matching substrings. However, this efficiency arises only in searching the encoded document hierarchy. Neither Evain nor Wan teach or suggest, alone or in combination, recording an encoded XPath fragment in a key index structure. To the contrary, Wan discloses translating the fragment address to an encoded form only when matching it to the encoded XML document.

In paragraph "A5" of the Office Action at page 7, it is also asserted that it would have been obvious to have modified the teachings of Evain with those of Wan "to save memory, since a reduced number of bytes are required to encode elements and attributes (Wan, para. 0049)."

The portion of Wan relied upon, however, is directed to reducing the number of bytes required to encode elements and attributes of an XML document, not a key index list. The portion of Evain relied upon discloses a key index list for an XML document, not the XML document itself. Accordingly, a person of ordinary skill in the art would not have understood paragraph [0049] of Wan to teach or suggest encoding an XPath fragment to reduce the number of bytes required to encode that XPath fragment. Rather, Wan is directed to reducing the number of bytes of the XML document. Accordingly, a person of ordinary skill in the art would not have modified the teachings of Evain as the Examiner asserts.

In paragraph "A5" of the Office Action at page 7, it is also asserted that it would have been obvious to have modified the teachings of Evain with those of Wan "to achieve a compromise between decoding time and the level of compression (Wan, para. 0057)." Again, the Examiner relies on a portion of Wan directed to encoding elements and attributes of an XML document, not a key index list. Accordingly, a person of ordinary skill would not have modified Evain based on Wan as asserted in the Office Action.

With regard to the obviousness rejections of the other claims the Examiner rejected as being obvious over Evain in view of Wan, Applicant respectfully traverses those rejections for at least the same reasons.

Rejections Under 35 U.S.C. § 103: Claims 85-90

Claims 85-90 are rejected under §103(a) as being unpatentable over the Evain reference in view of Wan and further in view of Hubbard ("Programming in C++). Applicant respectfully traverses this rejection.

Claim 85 is directed to an index list structure for use in locating and extracting a fragment of metadata divided into a plurality of fragments, in which the index list structure is contained in

a computer readable storage medium. The index structure includes a fragment type field and a key descriptor field. The fragment type field contains an encoded value assigned to a standard fragment type specifying a location of the fragment. The encoded value is assigned to the standard fragment type according to a convention for specifying standard fragment types. The key descriptor field contains location information specifying a location of a key for the index relative to the location of the fragment indicated by the fragment type field.

The Examiner cites Evain for teaching all the limitations of claim 85 except for the limitations of the fragment type field containing an encoded value assigned to a standard fragment type specifying a location of the fragment, and the encoded value being assigned to the standard fragment type according to a convention for specifying standard fragment types. The Examiner cites Wan for teaching these limitations, for the same reasons as discussed above regarding claim 54. The Examiner also admits that Evain and Wan do not teach the fragment type field and key descriptor field containing the encoded value. Hubbard is cited for teaching this limitation by disclosing that a program module contains a string field (e.g., "ABCDEFG").

The Examiner appears to take the position that based on Hubbard teaching that a program module can contain a string field, it would have been obvious to have modified the Evain/Wan combination discussed above with respect to claim 54, to store in a fragment type field an encoded value assigned to a standard fragment type specifying a location of the fragment. The Examiner asserts that it would have been obvious to have modified the Evain/Wan combination as such because "a user may prefer a direct access to the encoded string instead of indirect access."

It is respectfully submitted that not only does this position in the Office Action violate the principle of operation of Evain of storing all strings in the string repository, since Evain teaches

away from such a combination, but the prior art does not teach or suggest making such a modification and a person of ordinary skill in the art would not have had a reason to combine the teachings. Impermissible hindsight reasoning appears to be employed in rejecting these claims, using the Applicant's disclosure as a template to pick and choose teachings from the prior art to arrive at the claimed invention. Accordingly, the asserted Evain/Wan/Hubbard combination does not render claims 85-90 unpatentable.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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